The Center

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The Center is a periodic newsletter compiled by WRRC to alert potential partners of technology transfer opportunities.

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WRRC Team Successfully Transforms Castor

WRRC lead scientist Tom McKeon, and Research Associate, Grace Chen have announced success in genetically transforming the castor plant (*Ricinus communis L.*) The castor plant had previously proven resistant to transformation attempts and it was difficult to regenerate whole plants from excised plant segments. Using novel technology, the WRRC team successfully overcame these obstacles and incorporated marker genes into specific castor tissues and regenerated whole plants.

The team is currently using this method to develop safer castor plants in order to provide a domestic source of castor oil. The castor plant produces a bean containing castor oil, an oil of unique composition. Up to 90% of the fatty acid content of the oil is ricinoleate. As a result of its unique chemistry, castor oil and products derived from it are useful for lubricants, paints and coatings, cosmetics, bio-degradable plastics, anti-fungal components--about 300 bio-based products in total.

The presence of a naturally occurring toxic protein (ricin) and a highly allergenic storage protein greatly impede the production and processing of castor in the U.S. As a result, the U.S. must import all the castor oil it needs, over 100 million pounds per year. Improvement of castor to diminish these hazardous components has been limited by lack of suitable germplasm, but by using the WRRC castor transformation method it may be possible to develop castor with greatly reduced levels of toxin and allergens.

Grace Chen examines transgenic castor plant

The team at WRRC is also applying this method to improve agronomic and performance characteristics of the castor plant. Such plants will play a key role in the development of bio-based products in the U.S.

A U.S. patent application has been filed on this technology. It is available for licensing. We are also seeking a CRADA partner for this project.

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WRRC Patent Activity

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U.S. Patents Issued:

June 22, 1999, No. 5,914450
Glutenin Genes and Their Uses
Inventors: A. Blechl, O. Anderson, H. Rines, K. Somers, K. Torbert

August 17, 1999, No. 5,939,177
Method for Preserving Fresh Fruit
Inventors: C. Chen, T. Trezza, D. Wong, W. Camirand, A. Pavlath

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U.S. Patents Allowed:

August 6, 1999, Serial No. 08/918,832
Restructured Fruit and Vegetable Products and Processing Methods
Inventors: T. Mc Hugh, C. Huxsoll

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U.S. Patent Applications Filed:

June 11, 1999, Serial No. 09/330,358
Fruit and Vegetable Based Edible Wraps to Improve Quality and Extend Shelf Life of Foods
Inventors: T. McHugh, E. Sensi

August 20, 1999, Serial No. 09/378,441
Biodegradable Films for Agricultural Polymers
Inventors: A. Pavlath, C. Gosset, A. Voisin, W. Camirand, G. Robertson

October 21, 1999, Serial No. 09/425,321
Novel Bisexual Attractants, Aggregants and Arrestants for Adults and Larvae of Codling Moth and Other Species of Lepidoptera
Inventors: D. Light, C. Hendrick

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U.S. Provisional Patent Applications Filed:

August 30, 1999, Serial No. 60/151,582
Nucleic Acid Sequences Encoding Cell Wall-Degrading Enzymes and Use to Engineer Fusarium Resistance
Inventors: P. Okubara, A. Blechl, T. Hohn, R. Berka

November 23, 1999, Serial No. 60/167,360
Genetic Transformation of Ricinus communis, The Castor Plant
Inventors: T. McKeon, G. Chen

WRRC Receives Go-Ahead for Renovation of Pilot Plant

As many of you know who have visited the Center lately, the entire north wing which houses the Center's laboratories has been completely renovated and constitutes one of the most up-to-date and largest public research facilities exclusively for agriculture in the U.S. Now, remodeling of the Western Regional Research Center's four-story, 20,000 square-foot pilot plant is underway.

The pilot plant has been the home of many interesting investigations. The Center's pioneering research to improve processing of rice bran began here. WRRC scientists have shown that this nutritious brown layer of the grain can lower cholesterol. The pilot plant also housed early trials of a unique, now-patented process for making wheat-starch-based concrete. Today in the food processing section of the plant, researchers employ a highly-instrumented twin-screw extruder to create healthful new fruit or vegetable-based foods. Other experiments involve processing citrus for natural chemicals that have potential to fight cancer.

"Our remodeled pilot plant," says Center Director James N. Seiber, "will be ideal for a host of other projects that require equipment that we can't squeeze into our existing labs. We will have the capacity for new food safety and food processing studies with lettuce, sprouts, or poultry, for example, or for tests of biodegradable packaging materials made from wheat starch and/or protein. We'll be able to conduct on-site tests to explore new uses of crops like guayule--a desert shrub that our patented research has shown is a promising new domestic source of hypoallergenic natural latex. And, we may use the pilot plant to expand our experimental processing of insect diets for biological control."

The remodeled plant will also allow Center scientists to expand their partnering with the private sector. "We are looking forward to conducting expanded CRADA research in the new facility" says Dr. Seiber.

Attila Pavlath, President-Elect of ACS

Dr. Attila E. Pavlath, a collaborator at WRRC, is the president-elect of the American Chemical Society (ACS) for the year 2000. This is a major accomplishment for Dr. Pavlath and a distinct honor for the Center. Dr. Pavlath will serve as president-elect in the year 2000 and ACS president in 2001.

Open House -- Mark Your Calendar

Hold September 8, 2000 on your calendar. You are invited to an Open House which will provide an opportunity for you to get a first-hand look at our facilities and research and development program. More details will be provided this spring.